



22259-10-1US.ST25.txt
SEQUENCE LISTING

GARREN, Hideki
HO, Peggy P.
STEINMAN, Lawrence

<120> METHODS AND IMMUNE MODULATORY NUCLEIC ACID COMPOSITIONS FOR
PREVENTING AND TREATING DISEASE

<130> 022259-001010US

<140> 10/524,643

<141> 2005-02-10

<150> PCT/US2003/037157

<151> 2003-11-21

<160> 296

<170> PatentIn version 3.3

<210> 1

<211> 6

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<400> 1

gtgggtt

6

<210> 2

<211> 6

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<400> 2

atgggtt

6

<210> 3

<211> 6

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<400> 3

gcgggtt

6

<210> 4

<211> 6

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<400> 4

acgggtt

6

<210> 5
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 5
gtggct 6

<210> 6
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 6
atggct 6

<210> 7
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 7
gcggct 6

<210> 8
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 8
acggct 6

<210> 9
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 9
gtggctc 6

<210> 10
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 10
atggtc 6

<210> 11
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 11
gcggtc 6

<210> 12
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 12
acggtc 6

<210> 13
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 13
gtgctt 6

<210> 14
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 14
atgctt 6

<210> 15
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 15
gcgctt 6

| | | |
|--------|----------------------------------|---|
| <210> | 16 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 16 | |
| acgctt | | 6 |
| | | |
| <210> | 17 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 17 | |
| gtgcct | | 6 |
| | | |
| <210> | 18 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 18 | |
| atgcct | | 6 |
| | | |
| <210> | 19 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 19 | |
| gcgctt | | 6 |
| | | |
| <210> | 20 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 20 | |
| acgcct | | 6 |
| | | |
| <210> | 21 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |

<400> 21
gtgctc 6

<210> 22
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 22
atgctc 6

<210> 23
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 23
gcgctc 6

<210> 24
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 24
acgctc 6

<210> 25
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 25
gggggtt 6

<210> 26
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 26
agggtt 6

<210> 27
<211> 6

| | | |
|-------|----------------------------------|---|
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 27 | |
| | gaggtt | 6 |
| <210> | 28 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 28 | |
| | aaggtt | 6 |
| <210> | 29 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 29 | |
| | ggggct | 6 |
| <210> | 30 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 30 | |
| | agggct | 6 |
| <210> | 31 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 31 | |
| | gaggct | 6 |
| <210> | 32 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 32 | |

| | | |
|--------|----------------------------------|---|
| aaggct | | 6 |
| | | |
| <210> | 33 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 33 | |
| ggggtc | | 6 |
| | | |
| <210> | 34 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 34 | |
| agggtc | | 6 |
| | | |
| <210> | 35 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 35 | |
| gaggtc | | 6 |
| | | |
| <210> | 36 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 36 | |
| aaggtc | | 6 |
| | | |
| <210> | 37 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 37 | |
| gggctt | | 6 |
| | | |
| <210> | 38 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |

| | | |
|---------|----------------------------------|---|
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 38 | |
| aggcctt | | 6 |
| | | |
| <210> | 39 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 39 | |
| gagcctt | | 6 |
| | | |
| <210> | 40 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 40 | |
| aagcctt | | 6 |
| | | |
| <210> | 41 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 41 | |
| gggcctt | | 6 |
| | | |
| <210> | 42 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 42 | |
| aggcctt | | 6 |
| | | |
| <210> | 43 | |
| <211> | 6 | |
| <212> | DNA | |
| <213> | Artificial Sequence | |
| <220> | | |
| <223> | immunomodulatory oligonucleotide | |
| <400> | 43 | |
| gagcctt | | 6 |

<210> 44
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 44
 aagcct

6

<210> 45
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 45
 gggctc

6

<210> 46
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 46
 aggctc

6

<210> 47
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 47
 gagctc

6

<210> 48
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 48
 aagctc

6

<210> 49
 <211> 6
 <212> DNA
 <213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<400> 49
aacgtt

6

<210> 50
<211> 6
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 50
aaggtt

6

<210> 51
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide antigen

<400> 51

Gly Asp Leu Leu Ala Glu Ile Glu Thr Asp Lys Ala Thr Ile
1 5 10

<210> 52
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 52
tgactgtgaa ggtagagat ga

22

<210> 53
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (13)..(14)
<223> nn is GpG or non-GpG

<400> 53
tgactgtgtg rrnnyagag atga

24

<210> 54
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (13)..(14)
 <223> nn is GpG or non-GpG

<400> 54
 tgactgtgtg rynnnyagag atga

24

<210> 55
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (1)..(10)
 <223> n is any nucleotide

<220>
 <221> misc_feature
 <222> (13)..(14)
 <223> nn is GpG or non-GpG

<220>
 <221> misc_feature
 <222> (17)..(26)
 <223> n is any nucleotide

<400> 55
 nnnnnnnnnn rynnnyynnnn nnnnnn

26

<210> 56
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (1)..(10)
 <223> n is any nucleotide

<220>
 <221> misc_feature
 <222> (13)..(14)
 <223> nn is GpG or non-GpG

<220>
 <221> misc_feature
 <222> (17)..(26)
 <223> n is any nucleotide

<400> 56
 nnnnnnnnnn rrrnnyynnnn nnnnnn

26

<210> 57
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 57
 gggggggggg aaggttggg gggggg 26

<210> 58
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 58
 gggggggggg atggttggg gggggg 26

<210> 59
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 59
 gggggggggg acggttggg gggggg 26

<210> 60
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 60
 gggggggggg aagcttggg gggggg 26

<210> 61
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 61
 gggggggggg atgcttggg gggggg 26

<210> 62
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide
 <400> 62
 gggggggggg acgcttgggg gggggg 26

<210> 63
 <211> 26
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 63
 cccccccccc aaggttcccc ccccc 26

<210> 64
 <211> 26
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 64
 cccccccccc atggttcccc ccccc 26

<210> 65
 <211> 26
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 65
 cccccccccc acggttcccc ccccc 26

<210> 66
 <211> 26
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 66
 cccccccccc aagcttcccc ccccc 26

<210> 67
 <211> 26
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 67
 cccccccccc atgcttcccc ccccc 26

<210> 68
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 68
 cccccccccc acgcttcccc cccccc 26

 <210> 69
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 69
 tgactgtgaa gcttagagat ga 22

 <210> 70
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 70
 tgactgtgaa gctcagagat ga 22

 <210> 71
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 71
 tgactgtgaa gcctagagat ga 22

 <210> 72
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 72
 tgactgtgaa gccagagat ga 22

 <210> 73
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 73
tgactgtgag gcttagagat ga 22

<210> 74
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 74
tgactgtgag gctcagagat ga 22

<210> 75
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 75
tgactgtgag gcctagagat ga 22

<210> 76
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 76
tgactgtgag gcccagagat ga 22

<210> 77
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 77
tgactgtgga gcttagagat ga 22

<210> 78
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 78
tgactgtgga gctcagagat ga 22

<210> 79
<211> 22

<212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 79
 tgactgtgga gcctagagat ga 22

<210> 80
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 80
 tgactgtgga gcccagagat ga 22

<210> 81
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 81
 tgactgtggg gcttagagat ga 22

<210> 82
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 82
 tgactgtggg gctcagagat ga 22

<210> 83
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 83
 tgactgtggg gcctagagat ga 22

<210> 84
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 84

tgactgtggg gccagagat ga 22

<210> 85
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 85
 tgactgtgaa ggtagagat ga 22

<210> 86
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 86
 tgactgtgaa ggtagagat ga 22

<210> 87
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 87
 tgactgtgaa ggtagagat ga 22

<210> 88
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 88
 tgactgtgaa gccagagat ga 22

<210> 89
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 89
 tgactgtgag ggtagagat ga 22

<210> 90
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide
 <400> 90
 tgactgtgag ggtcagagat ga 22

<210> 91
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 91
 tgactgtgag ggctagagat ga 22

<210> 92
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 92
 tgactgtgag ggccagagat ga 22

<210> 93
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 93
 tgactgtgga ggtagagat ga 22

<210> 94
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 94
 tgactgtgga ggtcagagat ga 22

<210> 95
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 95
 tgactgtgga ggctagagat ga 22

<210> 96
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 96
 tgactgtgga ggccagagat ga 22

<210> 97
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 97
 tgactgtggg ggtagagat ga 22

<210> 98
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 98
 tgactgtggg ggtcagagat ga 22

<210> 99
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 99
 tgactgtggg ggctagagat ga 22

<210> 100
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 100
 tgactgtggg ggccagagat ga 22

<210> 101
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> immunomodulatory oligonucleotide
 <400> 101
 tgactgtgaa agttagagat ga 22

 <210> 102
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 102
 tgactgtgaa agtcagagat ga 22

 <210> 103
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 103
 tgactgtgaa agctagagat ga 22

 <210> 104
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 104
 tgactgtgaa agccagagat ga 22

 <210> 105
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 105
 tgactgtgag agttagagat ga 22

 <210> 106
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 106
 tgactgtgag agtcagagat ga 22

 <210> 107

<211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 107
 tgactgtgag agctagagat ga 22

<210> 108
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 108
 tgactgtgag agccagagat ga 22

<210> 109
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 109
 tgactgtgga agttagagat ga 22

<210> 110
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 110
 tgactgtgga agtcagagat ga 22

<210> 111
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 111
 tgactgtgga agctagagat ga 22

<210> 112
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 112
 tgactgtgga agccagagat ga 22

<210> 113
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 113
 tgactgtggg agttagagat ga 22

<210> 114
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 114
 tgactgtggg agtcagagat ga 22

<210> 115
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 115
 tgactgtggg agctagagat ga 22

<210> 116
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 116
 tgactgtggg agccagagat ga 22

<210> 117
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 117

tgactgtgaa ngttagagat ga

22

<210> 118
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 118
 tgactgtgaa ngtcagagat ga

22

<210> 119
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 119
 tgactgtgaa ngctagagat ga

22

<210> 120
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 120
 tgactgtgaa ngccagagat ga

22

<210> 121
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>

<221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 121
 tgactgtgag ngttagagat ga 22

 <210> 122
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 122
 tgactgtgag ngtcagagat ga 22

 <210> 123
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 123
 tgactgtgag ngctagagat ga 22

 <210> 124
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 124
 tgactgtgag ngccagagat ga 22

 <210> 125
 <211> 22
 <212> DNA
 <213> Artificial Sequence


```

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 125
tgactgtgga ngttagagat ga 22

<210> 126
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 126
tgactgtgga ngtcagagat ga 22

<210> 127
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 127
tgactgtgga ngctagagat ga 22

<210> 128
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 128
tgactgtgga ngccagagat ga 22

```

<210> 129
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 129
 tgactgtggg ngttagagat ga

22

<210> 130
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 130
 tgactgtggg ngtcagagat ga

22

<210> 131
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 131
 tgactgtggg ngctagagat ga

22

<210> 132
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 132
tgactgtggg ngccagagat ga 22

<210> 133
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 133
tgactgtgaa ncttagagat ga 22

<210> 134
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 134
tgactgtgaa nctcagagat ga 22

<210> 135
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 135
tgactgtgaa ncctagagat ga 22

<210> 136
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 136
 tgactgtgaa ncccagagat ga 22

 <210> 137
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 137
 tgactgtgag ncttagagat ga 22

 <210> 138
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 138
 tgactgtgag nctcagagat ga 22

 <210> 139
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 139
 tgactgtgag ncctagagat ga 22

 <210> 140
 <211> 22
 <212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<220>

<221> misc_feature

<222> (11)..(11)

<223> n is Inosine

<400> 140

tgactgtgag ncccagagat ga

22

<210> 141

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<220>

<221> misc_feature

<222> (11)..(11)

<223> n is Inosine

<400> 141

tgactgtgga ncttagagat ga

22

<210> 142

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<220>

<221> misc_feature

<222> (11)..(11)

<223> n is Inosine

<400> 142

tgactgtgga nctcagagat ga

22

<210> 143

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> immunomodulatory oligonucleotide

<220>

<221> misc_feature

<222> (11)..(11)

<223> n is Inosine

<400> 143

tgactgtgga ncctagagat ga

22

<210> 144
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 144
 tgactgtgga ncccagagat ga 22

<210> 145
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 145
 tgactgtggg ncttagagat ga 22

<210> 146
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 146
 tgactgtggg nctcagagat ga 22

<210> 147
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature

<222> (11)..(11)
 <223> n is Inosine
 <400> 147
 tgactgtggg ncctagagat ga 22

<210> 148
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine
 <400> 148
 tgactgtggg ncccagagat ga 22

<210> 149
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 149
 tgactgtgaa tgtagagat ga 22

<210> 150
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 150
 tgactgtgaa tgtcagagat ga 22

<210> 151
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 151
 tgactgtgaa tgctagagat ga 22

<210> 152
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>

<223> immunomodulatory oligonucleotide
 <400> 152
 tgactgtgaa tgccagagat ga 22

 <210> 153
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 153
 tgactgtgag tgtagagat ga 22

 <210> 154
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 154
 tgactgtgag tgtagagat ga 22

 <210> 155
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 155
 tgactgtgag tgtagagat ga 22

 <210> 156
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 156
 tgactgtgag tgccagagat ga 22

 <210> 157
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 157
 tgactgtgga tgtagagat ga 22

 <210> 158

<211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 158
 tgactgtgga tgtcagagat ga 22

<210> 159
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 159
 tgactgtgga tgctagagat ga 22

<210> 160
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 160
 tgactgtgga tgccagagat ga 22

<210> 161
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 161
 tgactgtggg tgtagagat ga 22

<210> 162
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 162
 tgactgtggg tgtcagagat ga 22

<210> 163
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 163
 tgactgtggg tgctagagat ga 22

<210> 164
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 164
 tgactgtggg tgccagagat ga 22

<210> 165
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 165
 tgactgtgaa tattagagat ga 22

<210> 166
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 166
 tgactgtgaa tatcagagat ga 22

<210> 167
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 167
 tgactgtgaa tactagagat ga 22

<210> 168
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 168
 tgactgtgaa taccagagat ga 22

<210> 169
 <211> 22
 <212> DNA

<213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 169
 tgactgtgag tattagagat ga 22

<210> 170
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 170
 tgactgtgag tatcagagat ga 22

<210> 171
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 171
 tgactgtgag tactagagat ga 22

<210> 172
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 172
 tgactgtgag taccagagat ga 22

<210> 173
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 173
 tgactgtgga tattagagat ga 22

<210> 174
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 174
 tgactgtgga tatcagagat ga 22

<210> 175
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 175
 tgactgtgga tactagagat ga 22

<210> 176
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 176
 tgactgtgga taccagagat ga 22

<210> 177
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 177
 tgactgtggg tattagagat ga 22

<210> 178
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 178
 tgactgtggg tatcagagat ga 22

<210> 179
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 179
 tgactgtggg tactagagat ga 22

<210> 180
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 180
 tgactgtggg taccagagat ga 22

<210> 181
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 181
 tgactgtgaa cgtagagat ga 22

<210> 182
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 182
 tgactgtgaa ccttagagat ga 22

<210> 183
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 183
 tgactgtgat gcttagagat ga 22

<210> 184
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 184
 tgactgtgat gctcagagat ga 22

<210> 185
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 185
 tgactgtgat gcctagagat ga 22

<210> 186
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 186
 tgactgtgat gccagagat ga 22

<210> 187
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 187
 tgactgtgac gcttagagat ga 22

<210> 188
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 188
 tgactgtgac gctcagagat ga 22

<210> 189
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 189
 tgactgtgac gcctagagat ga 22

<210> 190
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 190
 tgactgtgac gccagagat ga 22

<210> 191
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 191
 tgactgtggt gcttagagat ga 22

<210> 192
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 192
 tgactgtggt gctcagagat ga 22

<210> 193
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 193
 tgactgtggt gcctagagat ga 22

<210> 194
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 194
 tgactgtggt gcccagagat ga 22

<210> 195
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 195
 tgactgtggc gcttagagat ga 22

<210> 196
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 196
 tgactgtggc gctcagagat ga 22

<210> 197
 <211> 22

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 197
 tgactgtggc gcctagagat ga 22

<210> 198
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 198
 tgactgtggc gcccagagat ga 22

<210> 199
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 199
 tgactgtgat ggtagagat ga 22

<210> 200
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 200
 tgactgtgat ggtcagagat ga 22

<210> 201
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 201
 tgactgtgat ggctagagat ga 22

<210> 202
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 202

tgactgtgat ggccagagat ga 22

<210> 203
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 203
 tgactgtgac ggtagagat ga 22

<210> 204
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 204
 tgactgtgac ggtcagagat ga 22

<210> 205
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 205
 tgactgtgac ggctagagat ga 22

<210> 206
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 206
 tgactgtgac ggccagagat ga 22

<210> 207
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 207
 tgactgtggt ggtagagat ga 22

<210> 208
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide
 <400> 208
 tgactgtggt ggtagagat ga 22

<210> 209
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 209
 tgactgtggt ggctagagat ga 22

<210> 210
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 210
 tgactgtggt ggccagagat ga 22

<210> 211
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 211
 tgactgtggc ggtagagat ga 22

<210> 212
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 212
 tgactgtggc ggtagagat ga 22

<210> 213
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 213
 tgactgtggc ggtagagat ga 22

<210> 214
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 214
 tgactgtggc ggccagagat ga 22

<210> 215
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 215
 tgactgtgat agttagagat ga 22

<210> 216
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 216
 tgactgtgat agtcagagat ga 22

<210> 217
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 217
 tgactgtgat agctagagat ga 22

<210> 218
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 218
 tgactgtgat agccagagat ga 22

<210> 219
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> immunomodulatory oligonucleotide
 <400> 219
 tgactgtgac agttagagat ga 22

 <210> 220
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 220
 tgactgtgac agtcagagat ga 22

 <210> 221
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 221
 tgactgtgac agctagagat ga 22

 <210> 222
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 222
 tgactgtgac agccagagat ga 22

 <210> 223
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 223
 tgactgtggt agttagagat ga 22

 <210> 224
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 224
 tgactgtggt agtcagagat ga 22

 <210> 225

<211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 225
 tgactgtggt agctagagat ga 22

<210> 226
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 226
 tgactgtggt agccagagat ga 22

<210> 227
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 227
 tgactgtggc agttagagat ga 22

<210> 228
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 228
 tgactgtggc agtcagagat ga 22

<210> 229
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 229
 tgactgtggc agctagagat ga 22

<210> 230
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 230
tgactgtggc agccagagat ga 22

<210> 231
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> Inosine

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 231
tgactgtgat ngttagagat ga 22

<210> 232
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 232
tgactgtgat ngtcagagat ga 22

<210> 233
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 233
tgactgtgat ngctagagat ga 22

<210> 234
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 234
 tgactgtgat ngccagagat ga 22

<210> 235
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 235
 tgactgtgac ngttagagat ga 22

<210> 236
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 236
 tgactgtgac ngtcagagat ga 22

<210> 237
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 237
 tgactgtgac ngctagagat ga 22

<210> 238
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 238
 tgactgtgac ngccagagat ga

22

<210> 239
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 239
 tgactgtggt ngttagagat ga

22

<210> 240
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 240
 tgactgtggt ngtcagagat ga

22

<210> 241
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)

<223> n is Inosine

<400> 241
tgactgtggt ngctagagat ga

22

<210> 242
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 242
tgactgtggt ngccagagat ga

22

<210> 243
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 243
tgactgtggc ngtagagat ga

22

<210> 244
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 244
tgactgtggc ngtcagagat ga

22

<210> 245
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 245
 tgactgtggc ngctagagat ga 22

 <210> 246
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 246
 tgactgtggc ngccagagat ga 22

 <210> 247
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 247
 tgactgtgat ncttagagat ga 22

 <210> 248
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

 <400> 248
 tgactgtgat nctcagagat ga 22

 <210> 249
 <211> 22

<212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 249
 tgactgtgat ncctagagat ga

22

<210> 250
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 250
 tgactgtgat ncccagagat ga

22

<210> 251
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 251
 tgactgtgac ncttagagat ga

22

<210> 252
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 252

tgactgtgac nctcagagat ga

22

<210> 253
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 253
 tgactgtgac ncctagagat ga

22

<210> 254
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 254
 tgactgtgac ncccagagat ga

22

<210> 255
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 255
 tgactgtggt ncttagagat ga

22

<210> 256
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>

<221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 256
 tgactgtggt nctcagagat ga

22

<210> 257
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 257
 tgactgtggt ncctagagat ga

22

<210> 258
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 258
 tgactgtggt ncccagagat ga

22

<210> 259
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<220>
 <221> misc_feature
 <222> (11)..(11)
 <223> n is Inosine

<400> 259
 tgactgtggc ncttagagat ga

22

<210> 260
 <211> 22
 <212> DNA
 <213> Artificial Sequence

```

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 260
tgactgtggc nctcagagat ga 22

<210> 261
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 261
tgactgtggc ncctagagat ga 22

<210> 262
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is Inosine

<400> 262
tgactgtggc ncccagagat ga 22

<210> 263
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> immunomodulatory oligonucleotide

<400> 263
tgactgtgat tgtagagat ga 22

<210> 264
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

```

<223> immunomodulatory oligonucleotide
 <400> 264
 tgactgtgat tgtcagagat ga 22

 <210> 265
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide
 <400> 265
 tgactgtgat tgctagagat ga 22

 <210> 266
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide
 <400> 266
 tgactgtgat tgccagagat ga 22

 <210> 267
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide
 <400> 267
 tgactgtgac tgtagagat ga 22

 <210> 268
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide
 <400> 268
 tgactgtgac tgtcagagat ga 22

 <210> 269
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide
 <400> 269
 tgactgtgac tgctagagat ga 22

 <210> 270

<211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 270
 tgactgtgac tgccagagat ga 22

<210> 271
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 271
 tgactgtggt tgtagagat ga 22

<210> 272
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 272
 tgactgtggt tgcagagat ga 22

<210> 273
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 273
 tgactgtggt tgtagagat ga 22

<210> 274
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 274
 tgactgtggt tgccagagat ga 22

<210> 275
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

<400> 275
 tgactgtggc tgtagagat ga 22

<210> 276
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 276
 tgactgtggc tgtagagat ga 22

<210> 277
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 277
 tgactgtggc tgtagagat ga 22

<210> 278
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 278
 tgactgtggc tgtagagat ga 22

<210> 279
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 279
 tgactgtgat tagtagagat ga 22

<210> 280
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide

<400> 280
 tgactgtgat tagtagagat ga 22

<210> 281
 <211> 22
 <212> DNA

<213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 281
 tgactgtgat tactagagat ga 22

<210> 282
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 282
 tgactgtgat taccagagat ga 22

<210> 283
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 283
 tgactgtgac tattagagat ga 22

<210> 284
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 284
 tgactgtgac tatcagagat ga 22

<210> 285
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 285
 tgactgtgac tactagagat ga 22

<210> 286
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 286
 tgactgtgac taccagagat ga 22

<210> 287
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 287
 tgactgtggt tattagagat ga 22

<210> 288
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 288
 tgactgtggt tatcagagat ga 22

<210> 289
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 289
 tgactgtggt tactagagat ga 22

<210> 290
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 290
 tgactgtggt taccagagat ga 22

<210> 291
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> immunomodulatory oligonucleotide

 <400> 291
 tgactgtggc tattagagat ga 22

<210> 292
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> immunomodulatory oligonucleotide
 <400> 292
 tgactgtggc tatcagagat ga 22

<210> 293
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 293
 tgactgtggc tactagagat ga 22

<210> 294
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 294
 tgactgtggc taccagagat ga 22

<210> 295
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 295
 tgactgtgat cgtagagat ga 22

<210> 296
 <211> 22
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> immunomodulatory oligonucleotide
 <400> 296
 tgactgtgac cgtagagat ga 22